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## Fossil birds in the British Museum: corrections to Lydekker's (1891) catalogue

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In 1846-47, while in New Zealand as Government Commissioner for the settlement of native land claims, the Honourable W. B. D. Mantell, son of the renowned scientist Sir Gideon A. Mantell, acquired a large collection of sub-fossil bird bones, many of them from the dune sands of the South Taranaki-Wanganui region on the North Island's west coast. This material, as was typical of collections of that period, was shipped to England to be studied by the famed palaeontologist Sir Richard Owen, K.C.B. and later (c. 1855) purchased by the British Museum of Natural History (BMNH). Subsequently, much of it was incorporated into Lydekker's (1891) 'Catalogue of the fossil birds in the British Museum (Natural History)', a volume which, to date, remains the only comprehensive, published listing of that institution's subfossil avian material.

The first specimen to be discussed in this corrective note is the left tarsometatarsus of a small kiwi (Apterygidae) in the Walter Mantell collection (BMNH 32237a), illustrated and described by Lydekker (1891: 217-19). Its locality is given by Lydekker (1891: 219) only as "New Zealand", but it seems most probable that it was collected from the Holocene dune sands of Waingongoro, South Taranaki. Buick (1931) chronicled Mantell's collecting expeditions and reported that nearly all of his specimens were obtained from just 2 sources, firstly the dune sands on the South Taranaki coast, and secondly from swamp deposits at Waikouaiti in the South Island. BMNH 32237a exhibits the pale, yellow-brown colour, light weight and somewhat weathered appearance typical of subfossil bones from sand dune deposits, rather than the dark-brown, iron-stained appearance evident in bones from humic swamp deposits such as Waikouaiti.

Lydekker (1891: 218) erected a new genus, *Pseudapteryx*, for this specimen, thus making BMNH 32237a the unique holotype of *P. gracilis*. Lambrecht (1933: 227) and Brodkorb (1963: 219) accepted the validity of this species, but Oliver (1955: 47) only cited, without comment, Lydekker's original description. Kinsky *et al.* (1970) and Scarlett (1972) apparently disregarded *Pseudapteryx* despite there having been no formal rejection of the name.

Reid & Williams (1975: 307), following Storer (1960), regarded *Pseudapteryx* as "the earliest known kiwi", but the basis for such a claim seems tenuous, as Lydekker (1891: 219) stated that the specimen came from a "superficial deposit". If indeed, as argued above, it came from the Waingongoro sand dunes it is almost certainly no older than late Holocene (see Millener 1981: 458).

BMNH 32237a most closely resembles in size and shape the tarsometatarsus of *Apteryx owenii* (Little Grey Kiwi) and I consider, as will be shown, that the maintenance of *Pseudapteryx gracilis* as a distinct taxon is untenable and the name should become a junior synonym of *Apteryx owenii* Gould, 1847. BMNH 32237a was compared with recent and subfossil material of all 3 accepted species of kiwi – *Apteryx australis* Shaw & Nodder, 1913, *A. haasti* Potts, 1871 and *A. owenii* Gould, 1847 – in the collections of the National Museum (Wellington) (NMNZ) and the Smithsonian Institution (Washington, D.C.) (NMNH). In Fig. 1, 2 specimens of *Apteryx owenii* (NMNH 18279, NMNZ 22535) are illustrated for comparison with *Pseudapteryx gracilis* (cast of BMNH 32237a).

In the type description of his new genus *Pseudapteryx*, Lydekker (1891: 218) listed 3 characters which he considered were distinctive enough to warrant its separation from *Apteryx* (osteological terminology follows Baumel 1979).

(1) "The outer foramen [foramen vasculare proximale lateralis], above the tubercle for the tibialis anticus [tuberositas m. tib. cranialis] is placed on a much lower level than the inner one [f.v.p. medialis]" in contrast to what he considered (p. 216) was the typical condition in *Apteryx*, with 2 foramina "situated . . . on the same horizontal line".

The position and even the number of such foramina exhibits considerable intraspecific variation in several avian groups, penguins (Spheniscidae), moas (Dinornithidae) and the kiwis (Apterygidae) themselves providing just some of the many documented examples. Examination of *Apteryx* tarsometatarsi in the National Museum collections, as well as a more limited series at the Smithsonian Institution, revealed several specimens with 2 foramina positioned exactly as in *Pseudapteryx* (e.g. NMNH 18279, Fig. 1b), others with 3 foramina, 2 medial and one lateral (e.g. NMNZ 22535, Fig. 1c). Further, in some of those with 3 foramina, the more distal medial foramen was partially or completely occluded, the resultant condition closely approximating that in *Pseudapteryx*. Clearly, neither the number nor the relative positions of these proximal foramina can be considered reliable criteria for generic or specific distinction.

(2) "There is no depression [sulcus extensorius] on the anterior surface [facies dorsalis] of the shaft." This statement, applied to *Pseudapteryx*, is not strictly accurate, since BMNH 32237a does have a distinct sulcus on the proximal dorsal surface. As with (1) above, the size and shape of this sulcus varies considerably among individuals, several in the Smithsonian series (e.g. NMNH 18279, Fig. 1b) exhibiting a sulcus comparable in size to, or only marginally more extensive than that in *Pseudapteryx*.

(3) "There is no foramen [foramen vasculare distale] in the groove



Figure 2. Left tibiotarsi of (a) *Heterolocha acutirostris* NMNZ 15087; (b) "*H. acutirostris*" BMNH 32171 = *Palaeocorax moriorum*; (c) *P. moriorum* AU 6120.



Figure 1. Left tarsometatarsi of (a) "*Pseudapteryx gracilis*" (cast of holotype BMNH 32237a) = *Apterix owenii*; (b) *A. owenii* NMNH 18279; (c) *A. owenii* NMNZ 22535. Each scale division = 1 mm.

between the third and fourth trochleae [incisura intertrochlearis lateralis], but a distinct channel above this groove." The absence of this foramen in BMNH 32237a can be explained by one or more considerations. As with the proximal foramina, in several avian taxa the distal foramina of the tarsometatarsus exhibit considerable individual variability in position and may sometimes be absent. Archey (1941), Oliver (1949) and Scarlett (1972) have all remarked on such variability in the tarsometatarsi of moas and it is readily seen, on examination of a series of kiwi tarsometatarsi, that the same applies in this latter, related group. Typically the tendinal/vascular canal penetrates the distal shaft completely via foramina on the dorsal and plantar surfaces and in some specimens (e.g. NMNH 18279, NMNZ 22535, Fig. 1b, c) a branch [canalis interosseus tendineus] from this canal leads distally to a third foramen opening between the third and fourth trochleae. By contrast, in several examples, no sign of any distal foramina could be seen, a feature apparently comparable to that in BMNH 32237a.

A second consideration is the unusually deep gap between the third and fourth trochleae [incisura intertrochlearis lateralis] (see Fig. 1a). The slender shaft, flaring sharply to both the proximal extremity and the distal trochleae suggests that BMNH 32237a is from a somewhat subadult individual, in which case the gap between the third and fourth trochleae, and the absence of a distal foramen may be, in part, the result of incomplete fusion. Close examination of BMNH 32237a further reveals that, whether or not a distal foramen was ever present, bone bridging the basal portions of the third and fourth trochleae appears to have been eroded away, leading to the enlargement of the gap between them. The "distinct channel" on the dorsal surface of BMNH 32237a may be related to the subadult nature of this specimen (marking the line of fusion of the third and fourth embryonic metatarsals), but in any case is not a feature unique to *Pseudapteryx*. A subfossil specimen of *Apteryx owenii* (AU 4716 – Fig. 174 in Millener 1981: 506) clearly exhibits just such a channel, as do several specimens in the Smithsonian series (e.g. NMNH 18279, Fig. 1b).

In summary, since none of the characters used by Lydekker to differentiate *Pseudapteryx* from *Apteryx* is unique to the former, and none exceeds the range of individual variation shown by even a small series of *Apteryx* specimens, *Pseudapteryx* should be considered simply a junior synonym of *Apteryx*. Further, since BMNH 32237a exhibits no significant differences in size or shape from *Apteryx owenii*, even specific separation (as *gracilis*) is no longer warranted.

The second specimen considered in this corrective note is a passerine left tibiotarsus (BMNH 32171 – Fig. 2b) in Mantell's collection which is, in this case, clearly labelled as being from Waingongoro. This specimen, complete distally, but with its proximal end worn and mid-shaft somewhat imperfectly restored after post-mortem damage, was illustrated (Fig. 1, p. 5) and identified in Lydekker's (1891) Catalogue as that of a huia, *Heterolocha acutirostris* (Callaeidae).

BMNH 32171 was compared with material from the collections of the NMNZ and the Auckland University Geology Department (Auckland), the critical specimens being the following: *Heterolocha acutirostris*,

NMNZ 15087 (recent skeleton – from a mummified corpse) and AU 6794 (subfossil partial skeleton – from Holocene cave deposits, Waitomo, North Island); *Palaeocorax moriorum*, AU 6120 (subfossil skeleton – from Holocene dune sands, Tokerau Beach, North Island) and NMNZS 962 (subfossil skeleton – from Holocene dune sands, Chatham Island).

It is clearly evident from Fig. 2 that BMNH 32171 (2b) is, in fact, correctly referable not to *Heterolocha* (2a), but to *Palaeocorax moriorum* (Corvidae) (2c), the extinct New Zealand crow. The features in which the tibiotarsus of *Palaeocorax* differs most significantly from that of *Heterolocha* (Fig. 2a) [and agrees with BMNH 32171] are: the straighter and stouter shaft; the less pronounced flare of the internal lateral ridge below the cnemial crest [crista cnemialis cranialis]; the relatively larger, more circular (in lateral aspect) and less flared distal condyles [epicondylar distalis]; the broader and deeper tendinal groove [sulcus extensorius]; and the less robust tendinal bridge [tendons supratendineus].

The original misidentification of BMNH 32171 becomes more understandable when it is realised that at the time Lydekker's Catalogue was published the genus *Palaeocorax* Forbes, 1892 had yet to be described, and *Heterolocha* was then the largest passerine known in the New Zealand fauna.

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